

REMARKS

I. General Remarks

With this Amendment, Applicants cancel Claims 2, 5, and 6. Therefore, Claims 3, 4, 7-12, and 19-21 are all the claims currently pending in the present application.

Claims 7-8 and 21 stand rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over either Miyawaki et al., U.S. Patent No. 4,799,750 (“Miyawaki”), or Byer et al., U.S. Patent No. 6,013,221 (“Byer”), in view of Kanarian et al., U.S. Patent No. 5,131,068 (“Kanarian”).

Claims 7-9 and 21 stand rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over Miyawaki or Byer, in view of Kanarian and Hosaka, et al., JP 8-179493 (“Hosaka”).

Claims 7-8, 10, and 21 stand rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over Miyawaki or Byer, in view of Kanarian and DeFornel et al., U.S. Patent No. 5,384,464 (“DeFornel”).

Claims 3, 4, 7, 8, and 21 stand rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over Miyawaki or Byer, in view of Kanarian, Thompson et al., article entitled “Introduction to Microlithography”, pp. 288-335 (“Thompson”), and Saigo et al., U.S. Patent No. 4,564,576 (“Saigo”).

Claims 3, 4, 7-9, and 21 stand rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over Miyawaki or Byer, in view of Kanarian, Hosaka, Thompson, and Saigo.

Claims 3, 4, 7, 8, 10, and 21 stand rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over Miyawaki or Byer, in view of Kanarian, DeFornel, Thompson, and Saigo.

Claims 3, 4, 7, 8, 11, and 21 stand rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over Miyawaki or Byer, in view of Kanarian, Thompson, Saigo, and Harada et al., U.S. Patent No. 5,566,308 (“Harada”).

Claims 3, 4, 7, 8, 11-12, and 19-21 stand rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over Miyawaki or Byer, in view of Kanarian, Thompson, Saigo, Harada, Taguchi et al., JP 4-335620 (“Taguchi”), and Yamanouchi et al., U.S. Patent No. 6,198,197 (“Yamanouchi”).

II. Specification

With this Amendment, Applicants also submit a Substitute Specification. With the substitute specification, Applicants amend the term “near field” to instead read “near-field” throughout the specification. Applicants respectfully submit that the amendments are for purposes of clarity and to correct typographical errors only, and that no new matter has been added.

Entry and consideration of the enclosed Substitute Specification are respectfully requested.

III. Claims 3 and 4

Regarding the Examiner’s multiple §103(a) rejections of Claims 3 and 4, each rejection requires the combination of Miyawaki or Byer and Thompson and Saigo. Applicants respectfully traverse these rejections for at least the following reasons.

Applicants submit that one of ordinary skill in the art at the time of the presently-claimed invention would not have been motivated to combine either Thompson or Saigo with either

Miyawaki or Byer as suggested by the Examiner because there is no suggestion or motivation for doing so in the references themselves or in the knowledge available to one of ordinary skill in the art without resorting to impermissible hindsight.

The Examiner relies on Thompson and Saigo to teach a first and second resist layer, as required by Claims 3 and 4. To the extent that Thompson and Saigo teach multilayer photoresists, they are directed to masking silicon-based semiconductors. These are fundamentally different from multilayer resists used in conjunction with ferroelectric materials, as required by the present invention. This distinction is important because the effectiveness of a photoresist depends on its adhesion and other properties relative to the material being masked. There is no motivation in any of the four references that would have motivated one skilled in the art to combine these references to create the invention as recited in Claim 3.

Due to the above, the only possible motivation for the Examiner's proposed combination is Applicant's own disclosure, the reliance on which constitutes impermissible hindsight reconstruction under MPEP §2143 (see also *In re Vaeck*, 20 USPQ 1438 (Fed. Cir. 1991)).

Therefore, in view of at least the above-presented arguments, Applicants submit that Claims 3 and 4 are not obvious in view of the cited combinations of references, and respectfully request that the §103(a) rejections of these claims be reconsidered and withdrawn.

IV. Claims 7-12 and 19-21

With respect to the Examiner's §103(a) rejections of Claims 7-12 and 19-21, Applicants submit that these claims are patentable at least by virtue of their dependence on Claims 3 and 4, and for the following additional reasons.

Regarding Claim 10, Applicants submit that the cited combinations of references fail to teach or suggest a probe with an opening having a diameter shorter than a wavelength of the exposure light, as claimed. The Examiner relies on DeFornel to teach this limitation. The Examiner argues that DeFornel discloses a wavelength of 400 nm and a design size of 100 nm, thus requiring a probe size of less than 100 nm. The Examiner is in error.

At col. 4, lns. 15-17, DeFornel recites that the size of the design “exceeds 100 nm,” thus allowing for a probe diameter greater than 100 nm. At col. 4, lns. 34-36, DeFornel recites the use of ultraviolet light having a wavelength “under 400 nm.” In fact, ultraviolet light can have a wavelength ranging from approximately 1-400 nm. Therefore, it is not specifically taught in DeFornel that the diameter of the opening of the probe is smaller than the wavelength of the light used. In fact, the above descriptions in DeFornel teach that the opening of the probe may, in fact, be larger than the wavelength of the light used. This claimed limitation is also not inherent to the invention of DeFornel. Therefore, Claim 10 is not obvious in light of any of the combinations of references cited by the Examiner.

Regarding Claim 12, Applicants submit that the cited combinations of references fail to teach or suggest a periodic electrode with a line width of 0.3 microns or less. The Examiner relies on Taguchi and Yamanouchi to teach this limitation. The Examiner argues that the 0.6 micron pitch of Yamanouchi meets this limitation. However, Yamanouchi fails to teach or suggest an electrode width, and the claimed electrode line width of 0.3 microns is not an inherent result of a pitch of 0.6 microns.

The Examiner further argues that Taguchi, in teaching periods of 1-30 microns, embraces the required limitation. However, Taguchi discloses an electrode line width of 0.5 microns, which does not obviate the claimed limitation of 0.3 microns or less. Therefore, Claim 12 is not obvious in light of any of the combinations of references cited by the Examiner.

Regarding Claim 19, Applicant submit that the cited combinations of references fail to teach or suggest that a ratio (A/Λ) is less than 0.15, where A is an electrode line width and Λ is a period of inversion regions of the periodic domain inversion structure, as claimed. The Examiner relies on Taguchi and Yamanouchi to teach this limitation. As discussed above, Taguchi discloses an electrode line width of 0.5 microns. Yamanouchi discloses pitches of 0.6, 0.75, and 1.4 microns. Applicants submit that, even assuming arguendo that Taguchi and Yamanouchi could be combined to meet this limitation, the electrode line width of the Taguchi references and the pitch of the Yamanouchi reference fails to result in the required ratio of less than 0.15. Therefore, Claim 19 is not obviated by the cited combinations of references.

Therefore, for at least the above-presented reasons, Applicants submit that Claims 7-12 and 19-21 are patentable over the cited combinations of references and respectfully request that the §103(a) rejections of these claims be reconsidered and withdrawn.

V. Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned attorney at the telephone number listed below.

AMENDMENT UNDER 37 C.F.R. § 1.111
U.S. Application No. 09/649,013

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